

# EXHIBIT E

**Claim Chart for U.S. Patent No. 9,665,705 (“the ’705 Patent”)**

The Accused Instrumentalities include, but are not necessarily limited to, Nokia smartphones, including the Nokia 9 PureView and any Nokia product or device that is substantially or reasonably similar to the functionality set forth below. The Accused Instrumentalities infringe the claims of the ’705 Patent, as described below, either directly under 35 U.S.C. § 271(a), or indirectly under 35 U.S.C. §§ 271(b)–(c). The Accused Instrumentalities infringe the claims of the ’705 Patent literally and, to the extent not literally, under the doctrine of equivalents.

<b><u>Claim 1</u></b>	<b><u>Nokia 9 PureView</u></b>
1. A system for providing secure access to a controlled item, the system comprising:	To the extent that the preamble is deemed to be a limitation, Nokia 9 PureView is configured to use a system in accordance with this claim.
1a. a memory comprising a database of biometric signatures;	<p><b>The Nokia 9 PureView includes a memory comprising a database of encrypted fingerprint data.</b></p> <p>Nokia 9 PureView utilizes Sensory’s TrulySecure Face Biometrics for face unlock feature. (<a href="https://findbiometrics.com/mwc-2019-sensory-face-biometrics-nokia-smartphones-503015/">https://findbiometrics.com/mwc-2019-sensory-face-biometrics-nokia-smartphones-503015/</a>)</p> <p>Sensory’s FIDO Certified authentication software ensures sensitive data – biometric profiles stored as “highly encrypted irreversible code” – never leave a user’s device, and thanks to its contactless nature, enables a convenient and secure user experience. (<a href="https://mobileidworld.com/mwc-nokia-smartphones-sensory-trulysecure-face-biometrics-802281/">https://mobileidworld.com/mwc-nokia-smartphones-sensory-trulysecure-face-biometrics-802281/</a>)</p> <p>TrulySecure can also be used to reduce authentication data loads sent to cloud-based authentication systems by moving pre-authentication steps like liveness detection and feature extraction to the edge. TrulySecure’s on-device liveness detection can be used to immediately verify user authentication samples for liveness before sending captured authentication images to the server for processing. Taking it another step further, <b>by enabling TrulySecure’s on-device feature extraction, once the AI detects liveness, it can then immediately convert the user’s facial features into templates (irreversible mathematical data) that can be sent to the authentication server instead of sending multiple images.</b> This mitigates security risks associated with sending photos of a user’s face used for authentication over the internet, and significantly reduces the amount of data sent to the cloud for authentication.</p> <p>(<a href="https://www.prnewswire.com/news-releases/sensory-releases-trulysecure-face-authentication-with-3d-camera-support-gpu-processing-and-optional-cloud-capabilities-300736831.html">https://www.prnewswire.com/news-releases/sensory-releases-trulysecure-face-authentication-with-3d-camera-support-gpu-processing-and-optional-cloud-capabilities-300736831.html</a>)</p>

<u><b>Claim 1</b></u>	<u><b>Nokia 9 PureView</b></u>
1b. a transmitter subsystem comprising:	As set forth in elements 1b1, 1b2, and 1b3 below, the Nokia 9 PureView includes a transmitter subsystem.
1b1. a biometric sensor configured to receive a biometric signal;	<p><b>The Nokia 9 PureView includes a biometric sensor configured to receive a biometric signal.</b></p> <p>More specifically, the Nokia 9 PureView receives biometric signals through a sensor (in-display fingerprint sensor for fingerprint scanning and front camera for facial recognition) and processes the biometric data for biometric security.</p> <div data-bbox="583 586 1180 1289" data-label="Image"> </div> <div data-bbox="1188 667 1837 1289" data-label="Image"> </div> <p>(<a href="https://www.phonearena.com/news/Nokia-9-PureView-update-fixes-issues-with-the-in-display-fingerprint-scanner_id115459">https://www.phonearena.com/news/Nokia-9-PureView-update-fixes-issues-with-the-in-display-fingerprint-scanner_id115459</a>)</p>


<u><b>Claim 1</b></u>	<u><b>Nokia 9 PureView</b></u>
<p>1b2. a transmitter sub-system controller configured to match the biometric signal against members of the database of biometric signatures to thereby output an accessibility attribute; and</p>	<p><b>The Nokia 9 PureView includes a transmitter sub-system controller configured to match the biometric signal against members of the database of biometric signatures to thereby output an accessibility attribute.</b></p> <p>More specifically, the Nokia 9 PureView has a transmitter sub-system controller, which is a processor that determines a matching level by comparing the biometric signal received with the registered biometric database. Depending on the matching level, the device may remain locked or become unlocked.</p> <p>TrulySecure can also be used to reduce authentication data loads sent to cloud-based authentication systems by moving pre-authentication steps like liveness detection and feature extraction to the edge. TrulySecure's on-device liveness detection can be used to immediately verify user authentication samples for liveness before sending captured authentication images to the server for processing. Taking it another step further, by enabling TrulySecure's on-device feature extraction, once the AI detects liveness, it can then immediately convert the user's facial features into templates (irreversible mathematical data) that can be sent to the authentication server instead of sending multiple images. This mitigates security risks associated with sending photos of a user's face used for authentication over the internet, and significantly reduces the amount of data sent to the cloud for authentication.</p> <p><b>GPU Utilization for Faster Authentication</b></p> <p>Another major update in TrulySecure is the ability to split the biometric authentication data processing load between a device's GPU and applications processor. To accomplish this, key processor-heavy components of the core TrulySecure algorithm were isolated, streamlined and specially ported to run on a GPU. In testing, it was found that those isolated components of TrulySecure run as fast or even faster on the GPU than on the AP. Moving heavy processing components of TrulySecure from the AP to the GPU allows the applications processor to either prioritize other tasks, or work in parallel with the GPU to cut the amount of processing time required for the TrulySecure algorithm in half.</p> <p>(<a href="https://www.prnewswire.com/news-releases/sensory-releases-trulysecure-face-authentication-with-3d-camera-support-gpu-processing-and-optional-cloud-capabilities-300736831.html">https://www.prnewswire.com/news-releases/sensory-releases-trulysecure-face-authentication-with-3d-camera-support-gpu-processing-and-optional-cloud-capabilities-300736831.html</a>)</p>

<u><b>Claim 1</b></u>	<u><b>Nokia 9 PureView</b></u>
<p>1b3. a transmitter configured to emit a secure access signal conveying information dependent upon said accessibility attribute; and</p>	<p><b>The Nokia 9 PureView includes a transmitter configured to emit a secure access signal conveying information dependent upon said accessibility attribute.</b></p> <p>More specifically, upon information and belief, the Nokia 9 PureView has a processor, which includes a transmitter blocks, that matches the received biometric signal against the biometric database by calculating a matching level and transmits the matching level results to the output device to determine whether the device should remain locked or become unlocked.</p> <p>TrulySecure can also be used to reduce authentication data loads sent to cloud-based authentication systems by moving pre-authentication steps like liveness detection and feature extraction to the edge. TrulySecure's on-device liveness detection can be used to immediately verify user authentication samples for liveness before sending captured authentication images to the server for processing. Taking it another step further, by enabling TrulySecure's on-device feature extraction, once the AI detects liveness, it can then immediately convert the user's facial features into templates (irreversible mathematical data) that can be sent to the authentication server instead of sending multiple images. This mitigates security risks associated with sending photos of a user's face used for authentication over the internet, and significantly reduces the amount of data sent to the cloud for authentication.</p> <p><b>GPU Utilization for Faster Authentication</b></p> <p>Another major update in TrulySecure is the ability to split the biometric authentication data processing load between a device's GPU and applications processor. To accomplish this, key processor-heavy components of the core TrulySecure algorithm were isolated, streamlined and specially ported to run on a GPU. In testing, it was found that those isolated components of TrulySecure run as fast or even faster on the GPU than on the AP. Moving heavy processing components of TrulySecure from the AP to the GPU allows the applications processor to either prioritize other tasks, or work in parallel with the GPU to cut the amount of processing time required for the TrulySecure algorithm in half.</p> <p>(<a href="https://www.prnewswire.com/news-releases/sensory-releases-trulysecure-face-authentication-with-3d-camera-support-gpu-processing-and-optional-cloud-capabilities-300736831.html">https://www.prnewswire.com/news-releases/sensory-releases-trulysecure-face-authentication-with-3d-camera-support-gpu-processing-and-optional-cloud-capabilities-300736831.html</a>)</p>

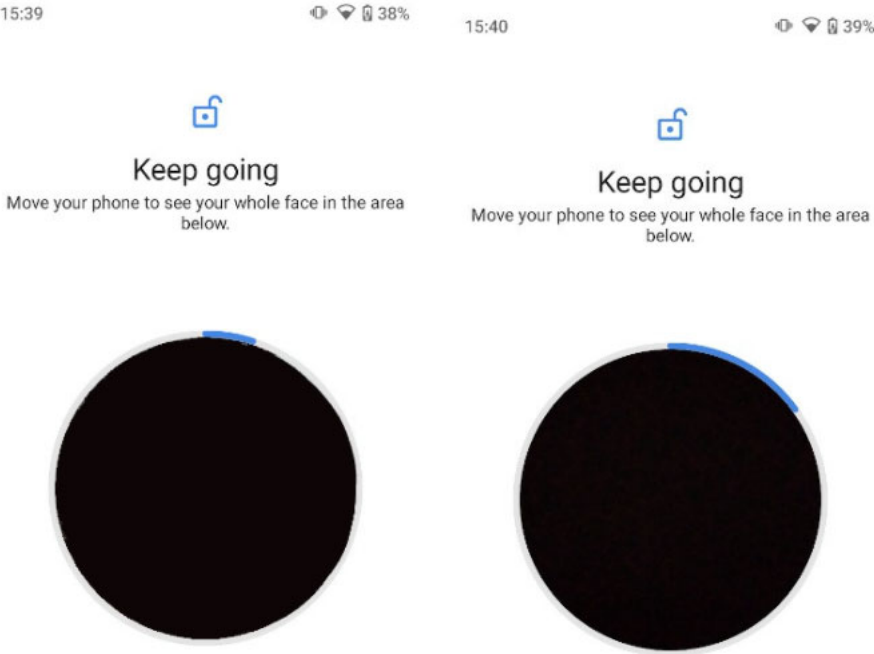
<u><b>Claim 1</b></u>	<u><b>Nokia 9 PureView</b></u>
1c. a receiver sub-system comprising:	As set forth in elements 1c1 and 1c2 below, the Nokia 9 PureView includes a receiver sub-system.
1c1. a receiver sub-system controller configured to: receive the transmitted secure access signal; and	<p><b>The Nokia 9 PureView includes receiver sub-system configured to receive the transmitted secure access signal.</b></p> <p>More specifically, upon information and belief, the Nokia 9 PureView includes an output device that receives a secure biometric signal transmitted from a processor and outputs a result accordingly.</p> <p>TrulySecure can also be used to reduce authentication data loads sent to cloud-based authentication systems by moving pre-authentication steps like liveness detection and feature extraction to the edge. TrulySecure's on-device liveness detection can be used to immediately verify user authentication samples for liveness before sending captured authentication images to the server for processing. Taking it another step further, <b>by enabling TrulySecure's on-device feature extraction, once the AI detects liveness, it can then immediately convert the user's facial features into templates (irreversible mathematical data) that can be sent to the authentication server instead of sending multiple images.</b> This mitigates security risks associated with sending photos of a user's face used for authentication over the internet, and significantly reduces the amount of data sent to the cloud for authentication.</p> <p><b>CPU Utilization for Faster Authentication</b></p> <p><b>Another major update in TrulySecure is the ability to split the biometric authentication data processing load between a device's GPU and applications processor.</b> To accomplish this, key processor-heavy components of the core TrulySecure algorithm were isolated, streamlined and specially ported to run on a GPU. In testing, it was found that those isolated components of TrulySecure run as fast or even faster on the GPU than on the AP. <b>Moving heavy processing components of TrulySecure from the AP to the GPU allows the applications processor to either prioritize other tasks,</b> or work in parallel with the GPU to cut the amount of processing time required for the TrulySecure algorithm in half.</p> <p>(<a href="https://www.prnewswire.com/news-releases/sensory-releases-trulysecure-face-authentication-with-3d-camera-support-gpu-processing-and-optional-cloud-capabilities-300736831.html">https://www.prnewswire.com/news-releases/sensory-releases-trulysecure-face-authentication-with-3d-camera-support-gpu-processing-and-optional-cloud-capabilities-300736831.html</a>)</p>

<u><b>Claim 1</b></u>	<u><b>Nokia 9 PureView</b></u>
1c2. provide conditional access to the controlled item dependent upon said information;	<p><b>The Nokia 9 PureView includes receiver sub-system configured to provide conditional access to the controlled item dependent upon said information.</b></p> <p>More specifically, the Nokia 9 PureView includes an output device that can provide access to the device based on the secure access signal received from the processor.</p> <p>TrulySecure can also be used to reduce authentication data loads sent to cloud-based authentication systems by moving pre-authentication steps like liveness detection and feature extraction to the edge. TrulySecure's on-device liveness detection can be used to immediately verify user authentication samples for liveness before sending captured authentication images to the server for processing. Taking it another step further, by enabling TrulySecure's on-device feature extraction, once the AI detects liveness, it can then immediately convert the user's facial features into templates (irreversible mathematical data) that can be sent to the authentication server instead of sending multiple images. This mitigates security risks associated with sending photos of a user's face used for authentication over the internet, and significantly reduces the amount of data sent to the cloud for authentication.</p> <p><b>CPU Utilization for Faster Authentication</b></p> <p>Another major update in TrulySecure is the ability to split the biometric authentication data processing load between a device's GPU and applications processor. To accomplish this, key processor-heavy components of the core TrulySecure algorithm were isolated, streamlined and specially ported to run on a GPU. In testing, it was found that those isolated components of TrulySecure run as fast or even faster on the GPU than on the AP. Moving heavy processing components of TrulySecure from the AP to the GPU allows the applications processor to either prioritize other tasks, or work in parallel with the GPU to cut the amount of processing time required for the TrulySecure algorithm in half.</p> <p>(<a href="https://www.prnewswire.com/news-releases/sensory-releases-trulysecure-face-authentication-with-3d-camera-support-gpu-processing-and-optional-cloud-capabilities-300736831.html">https://www.prnewswire.com/news-releases/sensory-releases-trulysecure-face-authentication-with-3d-camera-support-gpu-processing-and-optional-cloud-capabilities-300736831.html</a>)</p>



<u><b>Claim 1</b></u>	<u><b>Nokia 9 PureView</b></u>
1d. wherein the transmitter sub-system controller is further configured to:	The Nokia 9 PureView includes a transmitter sub-system controller that is configured to be used as set forth in elements 1d1, 1d2, and 1d3 below.
<p>1d1. receive a series of entries of the biometric signal, said series being characterized [characterized] according to at least one of the number of said entries and a duration of each said entry;</p>	<p><b>The Nokia 9 PureView includes transmitter sub-system controller configured to receive a series of entries of the biometric signal, said series being characterized according to at least one of the number of said entries and a duration of each said entry.</b></p> <p>More specifically, the Nokia 9 PureView receives a series of fingerprint signal by having users to touch a screen repeatedly to set up a fingerprint identification.</p>  <p>(<a href="https://www.phonearena.com/news/Nokia-9-PureView-update-fixes-issues-with-the-in-display-fingerprint-scanner_id115459">https://www.phonearena.com/news/Nokia-9-PureView-update-fixes-issues-with-the-in-display-fingerprint-scanner_id115459</a>)</p>



<u><b>Claim 1</b></u>	<u><b>Nokia 9 PureView</b></u>
	<p>The Nokia 9 PureView receives a series of facial images by having users position their face in front of a frontal camera to set up face recognition.</p>  <p>(<a href="https://www.hardreset.info/devices/nokia/nokia-32/faq/faq/face-unlock-nokia/">https://www.hardreset.info/devices/nokia/nokia-32/faq/faq/face-unlock-nokia/</a>)</p>
1d2. map said series into an instruction; and	<b>The Nokia 9 PureView includes transmitter sub-system controller configured to map said series into an instruction.</b>

<u><b>Claim 1</b></u>	<u><b>Nokia 9 PureView</b></u>
	<p>More specifically, upon information and belief, the Nokia 9 PureView includes a processor that can map a series of biometric signals into an instruction. The instruction is stored in the memory, and the processor communicates with the memory to map a series of biometric signals into an instruction.</p> <p>Sensory's FIDO Certified authentication software ensures sensitive data – biometric profiles stored as “highly encrypted irreversible code” – never leave a user's device, and thanks to its contactless nature, enables a convenient and secure user experience. (<a href="https://mobileidworld.com/mwc-nokia-smartphones-sensory-trulysecure-face-biometrics-802281/">https://mobileidworld.com/mwc-nokia-smartphones-sensory-trulysecure-face-biometrics-802281/</a>)</p> <p><b>CPU Utilization for Faster Authentication</b></p> <p>Another major update in TrulySecure is the ability to split the biometric authentication data processing load between a device's GPU and applications processor. To accomplish this, key processor-heavy components of the core TrulySecure algorithm were isolated, streamlined and specially ported to run on a GPU. In testing, it was found that those isolated components of TrulySecure run as fast or even faster on the GPU than on the AP. Moving heavy processing components of TrulySecure from the AP to the GPU allows the applications processor to either prioritize other tasks, or work in parallel with the GPU to cut the amount of processing time required for the TrulySecure algorithm in half.</p> <p>(<a href="https://www.prnewswire.com/news-releases/sensory-releases-trulysecure-face-authentication-with-3d-camera-support-gpu-processing-and-optional-cloud-capabilities-300736831.html">https://www.prnewswire.com/news-releases/sensory-releases-trulysecure-face-authentication-with-3d-camera-support-gpu-processing-and-optional-cloud-capabilities-300736831.html</a>)</p>
1d3. populate the data base according to the instruction, wherein the controlled item is one of: a locking mechanism of a physical access structure or an electronic lock on an	<b>The Nokia 9 PureView includes transmitter sub-system controller configured to populate the data base according to the instruction, wherein the controlled item is one of: a locking mechanism of a physical access structure or an electronic lock on an electronic computing device.</b>

<b><u>Claim 1</u></b>	<b><u>Nokia 9 PureView</u></b>
electronic computing device.	More specifically, upon information and belief, the Nokia 9 PureView includes a processor that populates the data base according to the instruction. Further, as discussed in detail above, the controlled item is the electronic lock on the Nokia 9 PureView.